

FURTHER REPORT ON THE TAXONOMY OF FOULING BRYOZOANS OF BOMBAY HARBOUR AND VICINITY¹

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(With nine text-figures)

Nine species of fouling bryozoans from Bombay coast are described. One is a new subspecies and two are new records from Indian waters.

INTRODUCTION

Studies on the fouling communities of Bombay harbour and vicinity has established that bryozoans are a major group contributing to the problem of marine fouling here, perhaps next in abundance to barnacles (Iyengar *et al.* 1957, Gopalakrishnan & Kelkar 1958, Chhapgar & Sane 1966, Santhakumaran & Pillai 1970, Pillai & Santhakumaran 1972, Pillai 1978). In two previous communications (Pillai & Santhakumaran 1972 and Pillai 1978) taxonomic details of 3 species namely *Hippoporina indica* Pillai, *Electra belulla* Hincks and *Scrupocellaria harmeri* Osburn have been presented. This paper deals with the taxonomy of 9 more species representing 7 genera which includes one new subspecies and two new records from Indian waters.

MATERIALS AND METHODS

Specimens were collected from timber test panels and submerged objects from Bombay harbour area and its vicinity.

To bring out taxonomic characters, the colonies were treated in sodium hypochlorite solution and stained lightly with ordinary fountain pen ink. Illustrations were made from such treated specimens with a camera lucida.

Measurements of the various parts of the zooids are presented in the following form, which would be useful in evaluating the constancy of various taxonomic characters and in comparing populations from different areas, as suggested by Cheetham (1966): abbreviation of the item measured; number of specimens measured; mean; standard deviation; observed range. All measurements are in millimetres. Measurements were made from random samples of zooids selected from different colonies as far as possible. All the zooids measured were fully grown and mature. The following abbreviations are used for measurements:—

Lz = Zooid length

lz = Zooid width

Lo = Primary orifice length including sinus.

lo = Primary orifice width

Lov = Ovicell length

lov = Ovicell width

Lav = Avicularium length

lav = Avicularium width

Lopes = Opesia length

lop = Operculum width .

SYSTEMATIC ZOOLOGY

Order—CTENOSTOMATA Busk, 1852.

Suborder—VESICULARINA Johnston, 1847.

Family—VESICULARIIDAE Johnston, 1838.

Genus—*Zoobotryon* Ehrenberg, 1831.

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Zoobotryon verticillatum (delle Chiaje),
1828.

(Fig. 1)

Hydra verticillata delle Chiaje, 1828:203.

Zoobotryon pellucidus Ehrenberg, 1831: no
pagination.

Amathia goodie Verrill, 1901:329.

Zoobotryon pellucidum Marcus, 1937:139.

Zoobotryon pellucidum Osburn, 1940:341.

Zoobotryon verticillatum (delle Chiaje)
Maturò, 1957:25.

Occurrence: A drifting colony from Trom-
bay, found entangled on a nylon rope used
for exposing test panels. Several colonies from
Versova Creek growing on a nylon rope placed
about 2 m deep.

Description: Translucent colonies consisting
of repeatedly and densely branched tufts
growing several cm in length. Stolon divided
into sections of 0.2 to 5 cm length with two
to four branches arising from each joint;
zooids ovoid or subcylindrical clustered irreg-
ularly at the distal ends of younger inter-
nodes, but arranged in two rows on each side
of the older internodes. Polypide with 13 ten-
tacles.

Measurements:

Lz (36)0.441(0.051)mm; 0.343—0.530 mm.

lz (36)0.204(0.027)mm; 0.156—0.234 mm.

Remarks:

Considerable differences were noticed in
growth, internoding and distribution of zooids
on the stolon between the colonies from Trom-
bay and Versova. The Trombay specimens
showed liberation of sperm through their ten-
tacles to the neighbouring water. The occur-
rence of sperm liberation in this species was
earlier reported by Bullivant (1967).

Previous records from Indian waters:

Vishakhapatanam harbour (Bay of Bengal)
(Ganapathi & Rao 1968).

Distribution:

Widely distributed in the warm waters of
the world including the Mediterranean and

Adriatic.

Order—CHEILOSTOMATA Busk, 1852.

Suborder—ANASCA Levinsen, 1909.

Family—MEMBRANIPORIDAE Busk, 1854;
Osburn, 1950.

Genus—*Membranipora* Blainville, 1830;
Osburn, 1950.

Membranipora amoyensis Robertson, 1921,
(Fig. 2)

Membranipora amoyensis Robertson, 1921:
49.

Acanthodesia serrata Hastings, 1930:707
(not of Hincks, 1882).

Membranipora hastingsae Osburn, 1950:
29 (not of Marcus, 1937).

Membranipora annae Osburn, 1953:774.

Occurrence:

Several colonies collected from test panels
exposed at Trombay (Bombay Harbour).

Description:

Colonies form whitish unilaminar or bilami-
nar encrustations. Zooids moderate in size,
quadrangular in shape, alternately arranged
and separated by conspicuous lines. Gymno-
cyst poorly developed with its distal rim
slightly raised and possesses two areas of thin
calcification at the corners—the 'lacunae'. An
extensive cryptocyst, growing from the proxi-
mal part extending laterally and reaching up
to the opercular level with regularly spaced
spinules numbering from 7 to 12 extending
from its inner margin, present. Small tubercles
often found on the cryptocyst. 'Nodules' as
described by Hastings (1930) developed from
the 'Lacunae' of the distal rim in many zooids
and growing as spines forward and backward
with extensive branching. Vicarious avicularia,
usually larger than normal zooid, possessing
tongue-shaped mandible, often present. Poly-
pide with 13 tentacles.

Measurements:

Lz(33)0.427(0.058)mm; 0.343—0.655 mm.

lz(33)0.211(0.034)mm; 0.156—0.280 mm.

Lav(10)0.447(0.083)mm; 0.312—0.546 mm.

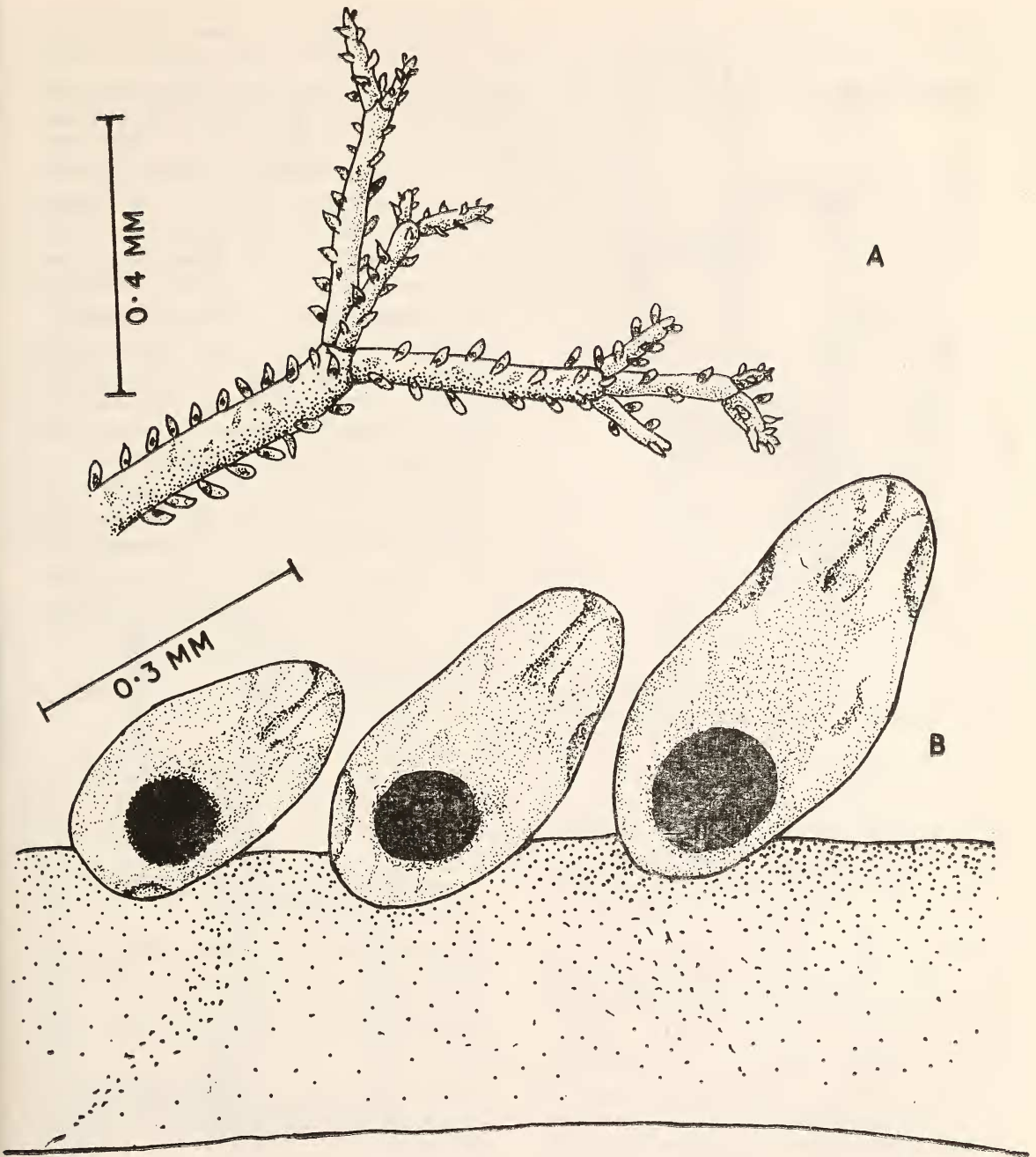


Fig. 1. *Zoobotryon verticillatum* (delle Chiaje)

A. Portion of colony showing internoding and arrangements of zooids. B. An internode bearing zooids.

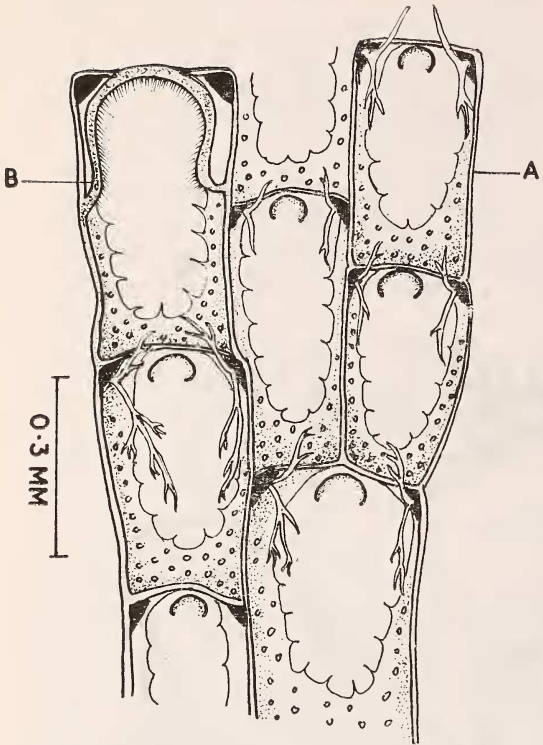


Fig. 2. *Membranipora amoyensis* Robertson—Portion of colony with normal zooids and a vicarious avicularium.
A. Zooid. B. Avicularium.

lav(10)0.242(0.024)mm; 0.202—0.280 mm.
lop(31)0.137(0.009)mm; 0.124—0.156 mm.
Lopes(32)0.327(0.055)mm; 0.218—0.390 mm.

Remarks:

A comparison of the descriptions and figures given by Osburn (1950 & 1953) with that of Robertson (1921) clearly indicates that both are one and the same. Examination of a large number of the present specimens showed almost all the characters mentioned by Robertson (1921), Hastings (1930) and Osburn (1950 & 1953). In addition, it is noticed that the spines developed from the 'lacunae' are capable of growing and branching

more extensively. In many cases, they are long and densely branched and almost cover the opesia of the zooids from which they grow by their proximal growth and the proximal area of the succeeding zooid by their distal growth. Another difference noticed is in the size of the avicularia which, on an average, are larger than the normal zooids. It is reported by Cook (1968a) that *Membranipora annae* a synonym of this species is found in warm shallow waters where the salinity is reduced or variable. A study of the vertical distribution and seasonal occurrence of this species at Bombay Harbour area, however, showed that they occur up to the mud level at Trombay where the depth is about 9 m with maximum intensity just below the low water level and a marked decrease in their occurrence during the monsoon months when salinity dropped considerably. Maximum settlement was found to be during the post-monsoon period of the year.

Previous records from Indian waters:

Cochin harbour (Arabian sea) (Menon & Nair 1967).

Distributions:

Chinese coast (Robertson 1921) Panama canal (Hastings 1930, Osburn 1950, 1953; Powell 1971) West African Coast (Cook 1968 a).

Membranipora tenuis Desor, 1848.

(Fig. 3)

- Membranipora tenuis* Desor, 1848:66.
- Membranipora denticulata* Busk, 1856:176.
- Biflustra denticulata* Smitt, 1873:18.
- Membranipora tenuis* Verrill & Smith, 1874: 712.
- Biflustra denticulata* Verrill, 1878:305.
- Membranipora tenuis* Osburn, 1912:231; 1950:26.
- Hemiseptella tuberosa* Canu & Bassler, 1923:71.
- Acanthodesia tenuis* Mercus, 1937:42

Acanthodesia tenuis Osburn, 1940:353; 1944:35; 1947:9.

Acanthodesia tenuis Hutchins, 1945:539.

Membranipora tenuis Pearse & Williams, 1951:137.

Membranipora tenuis Maturo, 1957:35.

Occurrence:

Several colonies collected from test panels exposed at Trombay (Bombay harbour).

Description:

Colonies form whitish unilaminar or multilaminar encrustations. Zooids moderate in size, rectangular or quadrangular in shape, linearly arranged and separated by conspicuous lines; membranous ectocyst present; Gymnocyst very much reduced and mural rim finely beaded; distal wall slightly raised and arcuate; cryptocyst well developed, extending from the proximal end narrowly along lateral

walls up to the distal end; its surface tuberculated and border serrated into short spines projecting inward; operculum well sclerotized. Tentacle number varies from 10 to 13.

Measurements:

Lz (32)0.417(0.078) mm; 0.310—0.765 mm.

Iz (32)0.204(0.037)mm; 0.140—0.275 mm.

lop (32)0.146(0.011)mm; 0.124—0.156 mm.

Lopes (32)0.384(0.079)mm; 0.280—0.640 mm.

Remarks:

An examination of a number of colonies of the present specimens revealed that the features exhibited agree with the descriptions given by various authors for both *M. tenuis* and *M. perfragilis* except for the absence of avicularia in any of the colonies examined. Hastings (1945) and Osburn (1950) have confirmed in their description the presence of avicularia in *M. perfragilis*. Therefore, based on this difference the present specimens are tentatively classified under *Membranipora tenuis*. This species showed sperm liberation through tentacles. They occur along Bombay harbour area throughout the year with maximum intensity during post-monsoon period. They are vertically distributed from below low water level up to mud level at this harbour.

Previous records from Indian waters:

Bombay harbour (Arabian Sea).

(Gopalakrishnan and Kelkar 1958).

Distribution:

It occurs on the Atlantic coast from Massachusetts to Brazil.

Membranipora savartii (Audouin), 1826.

(Fig. 4)

Flustra savartii Audouin, 1826:240.

Biflustra savartii Smitt, 1873:20.

Membranipora savartii Osburn, 1914:194.

Acanthodesia savarti Canu & Bassler, 1923: 31; 1928:14.

Acanthodesia savartii Marcus, 1937: 40.

Acanthodesia savartii Osburn, 1940:352.

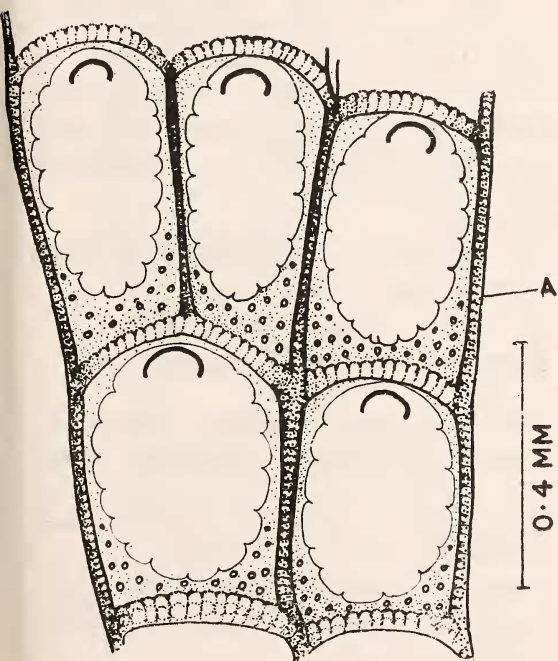


Fig. 3. *Membranipora tenuis* Desor—Portion of a colony showing the arrangement of zooids.

A. Zooid.

Acanthodesia savarti Osburn, 1947:9.
Membranipora savarti Osburn, 1950:27.
Membranipora savartii Maturo, 1957:35.
Acanthodesia savartii Chhapgar & Sane
 1967:450.

Occurrence:

Several colonies collected from test panels exposed at Trombay (Bombay harbour).

Description:

Colonies form whitish unilaminar or multilaminar encrustations, zooids moderate in size, rectangular or quadrangular in shape, alternately arranged and separated by distinct lines. Gymnocyte poorly developed and the mural rim plane; cryptocyst well developed and its proximal part bears the most distinguishing part—the denticulate process projecting into the opesia. This process assumes varying shapes in different zooids and can be totally absent in certain zooids as illustrated by Harmer (1926). A few small spines may project into the opesia from its margin. Polypide with 12 tentacles.

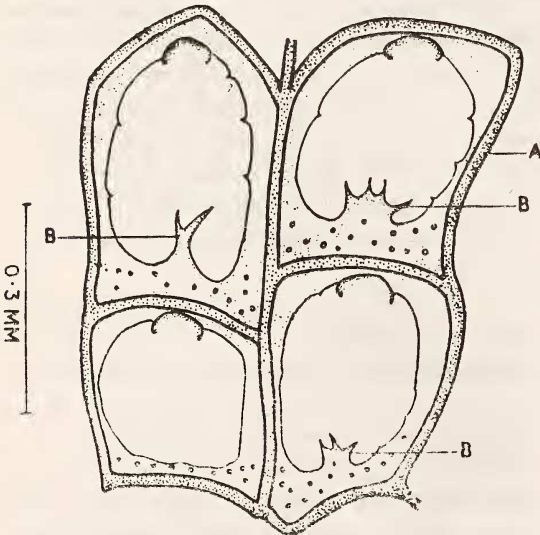


Fig. 4. *Membranipora savartii* (Audouin)—Part of a colony showing arrangements of zooids and different types of denticulate processes.
 A. Zooid. B. Denticulate process.

Measurements:

Lz (41)0.329(0.029)mm; 0.280—0.405 mm.
 lz (39)0.237(0.028)mm; 0.171—0.296 mm.
 Lopes (39)0.271(0.025)mm; 0.218—0.312 mm.

Remarks:

The variability in the development of cryptocyst and the denticle developed from it is well exhibited in the present specimens. As may be noted from the diagram the denticle may assume the form of a multiserrated process or just a bifurcated spine. The mural rim and cryptocyst of the present specimens are completely devoid of tubercles. Sperm liberation, in this species is found to be through tentacles. This species occurs along Bombay coast throughout the year with maximum intensity during post-monsoon period. They are vertically distributed at Trombay from just below low tide level up to the mud level.

Previous records from Indian waters:

From Indian Ocean (Thornely 1907, as *Membranipora denticulata*), Bombay coast (Arabian sea) (Chhapgar & Sane 1966, Santhakumaran & Pillai 1970 as *Acanthodesia savartii*)

Distribution:

It is a common species around the world in warmer shallow waters.

Genus *Conopeum* Gray, 1848.

Conopeum reticulum (Linnaeus), 1767.

(Fig. 5)

Millepora reticulum Linnaeus, 1767:1284.

Membranipora lacroixii Robertson, 1908: 261.

Membranipora lacroixii var. *triangulata* O'Donoghue, 1923:25.

Conopeum reticulum Harmer, 1926: 211.

Conopeum reticulum Osburn, 1940:350: 1950:31.

Occurrence:

Several colonies collected from test panels exposed at Trombay (Bombay harbour).

Description:

Colonies form whitish unilaminar or multilaminar encrustations. Zooids moderate in size, hexagonal to oval in shape, alternately arranged and separated by distinct lines; Gymnocyst very much reduced and the opesia occupies the whole of the frontal surface. The gymnocyst bears the characteristic triangular area at the proximal corners; short spines seldom formed from both or one of these areas; cryptocyst almost uniformly formed around the opesia and its margin is characteristically crenated with small tubercles on it. Operculum strongly sclerited.

Measurements:

Lz(35)0.334(0.044)mm; 0.234—0.437 mm.

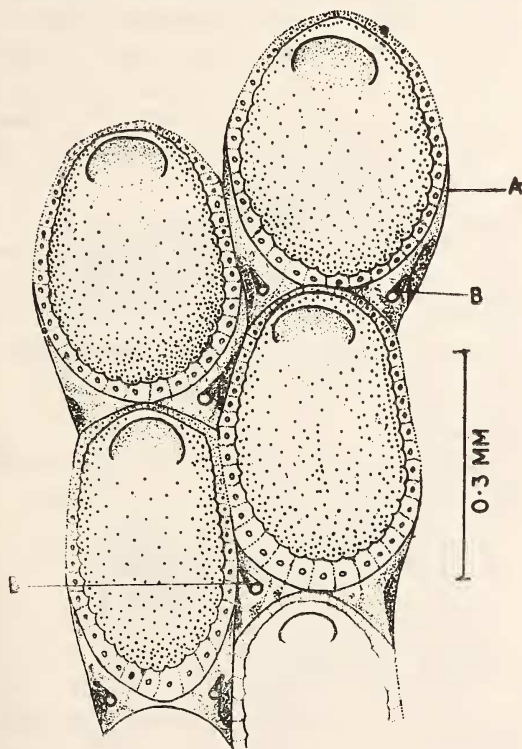


Fig. 5. *Conopeum reticulatum* (Linnaeus)—Part of a colony showing the arrangement of zooids and the short spine arising from the triangular area. A. Zooid. B. Spine.

lz(35)0.171(0.037)mm; 0.078—0.249 mm.

Lopes (35)0.307(0.039)mm; 0.203—0.405 mm.

Remarks:

It is observed in the present specimens that the growths from the triangular area assume the form of short spines, not as tubercles as described by Osburn in case of his specimens. The cryptocyst showing conspicuous crenation is another speciality of the present specimens. Reproductive habits showed sperm liberation through tentacles in this species also. At Trombay this species is found to occur throughout the year with peak settlement during the post monsoon period. It is found vertically distributed from low water level up to mud level.

Previous records from Indian waters:

From Chilka lake (Bay of Bengal) (Annandale 1907).

Distribution:

In American waters it is recorded from Alaska to Southern California (Osburn 1950) and in Europe this species extends from Skagerrak and Kattegat down the Atlantic coast and possibly into Mediterranean (Ryland 1965).

Family ELECTRINIDAE d'Orbigny, 1851

Genus *Electra* Lamouroux, 1816.

Electra bengalensis (Stoliczka), 1869.

(Fig. 6)

Membranipora bengalensis Stoliczka, 1869: 55.

Membranipora bengalensis Thornely, 1907: 186.

Electra anomala Osburn, 1950:36.

Electra bengalensis Cook, 1968b: 141.

Occurrence:

Several colonies collected from test panels immersed at Trombay (Bombay port).

Description:

Delicate colonies forming whitish unilaminar or multilaminar encrustations or bushy

clumps; zooids smooth, relatively large in size, quadrangular in shape and separated by thin lines; gymnocyst most pronounced at proximal part and extends distally in such a way as to form an oval opesia abruptly narrowing at the base of the operculum; marginal spines vary in number from 10 to 20 and of different size also, depending on the age of zooids. In older zooids, they form a roof above the frontal membrane; two short spines always present on either side of the operculum, looking as if arising from the distal zooids; a pair of characteristic spines, which ramify into branches in course of growth, present on the

frontal surface of the semicircular operculum; cryptocyst not evident.

Measurements:

- Lz (31)0.614(0.05)mm; 0.468—0.702 mm.
- lz (31)0.283(0.03)mm; 0.218—0.327 mm.
- lop (38)0.143(0.01)mm; 0.124—0.156 mm.
- Lopes (31)0.543(0.037)mm; 0.436—0.6 mm.

Remarks:

A special feature noticed in the present specimens is the multibranched nature of the paired spines present on the operculum in older zooids, whereas previous authors have mentioned bifurcated ones for their specimens. It may be a geographic variation or previous authors might have observed insufficiently grown colonies. Sperm liberation is through tentacles. At Trombay, this species occurs throughout the year with peak settlement during the post-monsoon period. It is found vertically distributed from low water level up to mud level at this place.

Previous records from Indian waters:

Port Canning ponds (Stoliczka); Snod Island (Thornely 1907); Visakhapatnam harbour (Ganapati & Satyanarayanan Rao 1968) (all from Bay of Bengal), Bombay harbour (Santhakumaran & Pillai 1970) (Arabian sea).

Distribution:

Balboa (Osburn 1950), Bay of Panama (Powell 1971), West Africa (Cook 1968a).

Suborder—ASCOPHORA Levinsen, 1909.

Family—SMITTINIDAE Levinsen, 1909.

Genus—*Smittina* Norman, 1903.

Smittina smittiella Osburn, 1947.

(Fig. 7)

Escharella landsborovi var. *minuscula* Smitt, 1873:60.

Smittina sp. (Marcus), 1938:44.

Smittina smittiella Osburn, 1947:37.

Smittina smittiella Osburn, 1952:404.

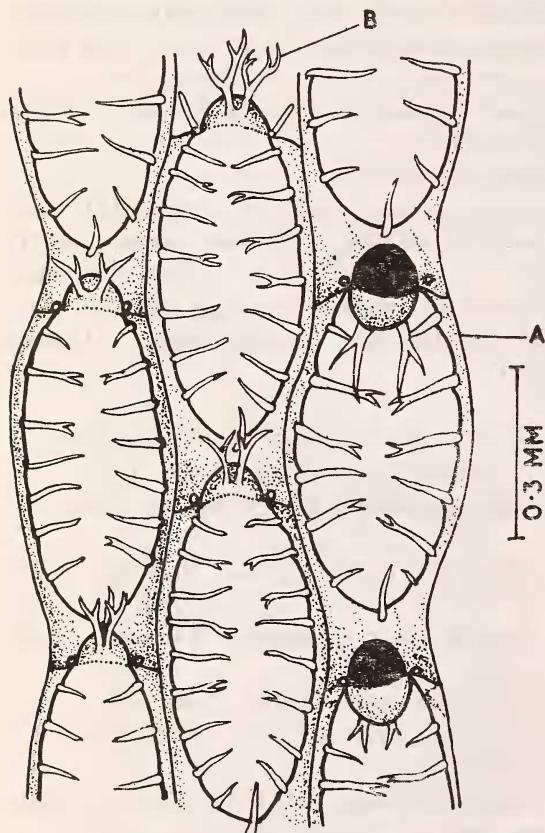


Fig. 6. *Electra bengalensis* (Stoliczka)—Part of a colony showing arrangements of the zooids and multibranched spines on the operculum.

A. Zooid. B. Multibranched spine.

Occurrence:

A few colonies obtained from a big vertebra (possibly of whale) collected at 10 fathoms from Bombay.

Description:

Colonies form light brownish unilaminar or multilaminar encrustations with tubular expansions of zooids formed from them. Zooids distinct; rectangular and serially arranged. Frontal a tremocyst with a network of pores borne on small tubercles all over, numbering about 50; orifice almost circular, slightly wider than long with a pair of very delicate condyles. A broad lyrula with laterally projecting corners present. Orifice surrounded by a fairly raised collar. Secondary orifice has inward projections on its proximal side due to the pre-

sence of avicularia on it. Distal wall visible through the orifice due to its proximal inclination. Usually three suboral avicularia present on the proximal part of orifice—two laterals and one median; avicularia somewhat triangular with the frontal portion projecting into the secondary aperture and the rostrum directed away from the orifice. Lateral wall has 2 rows of communication pores, each having 6 pores. Distal wall with 4-6 pores scattered near the base.

Measurements:

Lz(25)0.477(0.05)mm; 0.343—0.561 mm.

lz(25)0.227(0.02)mm; 0.187—0.265 mm.

Lo(25)0.083(0.006)mm; 0.078—0.094 mm.

lo(25)0.089(0.008)mm; 0.078—0.101 mm.

Lav(25)0.046(0.002)mm; 0.043—0.050 mm.

Remarks:

The present specimens agree in size and main features with Osburn's description (1947). However, the serrations or denticulations on the tip of the rostrum reported by him is absent in the present ones. Another difference noticed is the presence of three suboral avicularia on most of the zooids. These specimens do not show ovicell also. Perhaps it was collected before attaining sexual maturity.

Previous record from Indian waters:

This is the first record of this species from Indian waters.

Distribution:

Carribbean sea, Florida, eastern Pacific (Osburn 1952). Bay of Santos, Brazil (Marcus 1938).

Genus—*Parasmittina* Osburn, 1952.

Parasmittina crosslandi serrata (subsp. nov.)
(Fig. 8)

Diagnosis:

A subspecies of *Parasmittina crosslandi* with orifice possessing serrated anter, devoid of lyrula and with nonporous ovicells.

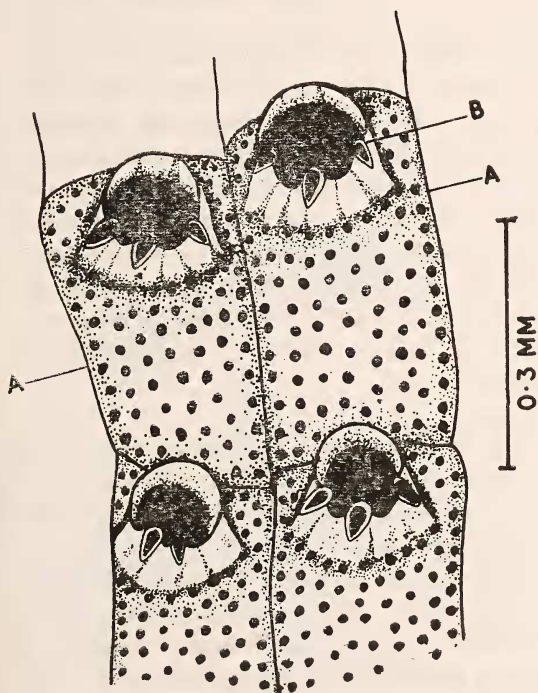


Fig. 7. *Smittina smittiella* Osburn—Part of a colony showing arrangements of zooids and the suboral avicularium.

A. Zooid. B. Suboral avicularium.

Description:

Zoarium whitish, forming unilaminar or multilaminar encrustations with tubular expansions often formed from them; zooids quadrate to hexagonal in shape, arranged in quincunx, separated by vague calcareous lines. Frontal a granular pleurocyst having a row of areolar pores and occasionally additional pores at the distal part, totally numbering between 10 and 20. Orifice oblong, with delicate condyles dividing it into a semicircular anter and a slightly curved poster. Margin of the anter serrated into 'teeth' numbering between 11 and 14. Lyrula absent. Orificial collar of moderate height, discontinuous proximally giving rise to two or three upward projections, making the secondary orifice irregular in shape.

Avicularia of various sizes, 'lingulate', located proximal to the orifice. Rostrum mostly directed proximally, occasionally laterally also. A few zooids showed more than one avicularium.

Ovicells hyperstomial, globular and partially embedded in the succeeding zooids. Small tubercles found all over.

Lateral wall with one row of 6 to 8 septula and distal wall with one row of 4 to 6 septula. Pores comparatively large in size.

Measurements:

- Lz(25)0.422(0.050)mm; 0.280—0.520 mm.
- lz(25)0.310(0.043)mm; 0.240—0.400mm.
- Lo(25)0.105(0.012)mm; 0.080—0.120 mm.
- lo(25)0.115(0.009)mm; 0.090—0.120 mm.
- Lov(25)0.142(0.018)mm; 0.120—0.160 mm.
- lov(25)0.174(0.018)mm; 0.160—0.200 mm.
- Lav(25).....0.120—0.320 mm.

Comparison:

In general size and features the present specimens resemble *Parasmittina crosslandi* Hastings (1930) very much. It possesses the 'lingulate' type of avicularia as reported by Osburn (1952). The configuration of the orificial collar is also more or less of the same pattern. However, the important difference observed is the presence of the teeth-like serrations on the border of the anter. This is a unique feature, so far not reported for any other species of this genus. The present specimens do not possess a lyrula also, further differentiating it from *P. crosslandi*. Yet another difference is the absence of pseudopores on ovicells.

Material:

A number of colonies obtained from a big vertebra (possibly of whale) collected at 10 fathoms from Bombay (19°05'N and 72°38'E).

Type specimens:

Holotype and paratype are deposited in the collection of Wood Preservation Centre (Marine) of the Forest Research Institute, at Central Institute of Fisheries Education, Bombay-400 061.

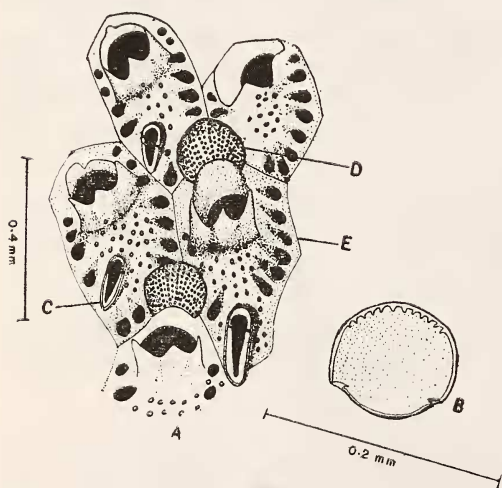


Fig. 8. *Parasmittina crosslandi serrata* (subsp. nov.)
 A. Part of colony showing arrangement of zooids.
 B. Orifice showing the anter with 'Serrations'.
 C. Avicularium. D. Ovicell. E. Zooid.

Family—HIPPOPORINIDAE Bassler, 1935.

Genus—*Hippoporina* Neviani, 1895.

Hippoporina porosa (Verrill), 1879.

(Fig. 9)

Escharella pertusa? (Esper) Verrill, 1875: 41.

Escharina porosa Verrill, 1879: 193.

Lepralia pertusa (Esper) Osburn, 1912: 214.

? *Hippodiplosia pertusa* (Esper) Hastings, 1930: 724.

Hippodiplosia pertusa (Esper) Osburn, 1933: 41.

Hippoporina porosa Maturo & Schopf, 1968:48.

Occurrence:

A number of colonies found encrusted on a big vertebra (possibly of whale) collected at 10 fathoms from Bombay.

Description:

Colonies form reddish brown unilaminar or multilaminar encrustations with tubular expansions of the zooids often formed from it. Zooids distinct, rectangular to hexagonal in shape and arranged serially; frontal a tremo-

cyst with a network of 50 to 70 pores; orifice almost round, slightly wider than long, bipartite by strong condyles into large semicircular anter and small crescentic poster; avicularium absent; ovicells hyperstomial, prominent, globose and are perforated by small pores; lateral wall with two rows of communication pores numbering from 6-8 and distal wall with 8-12 communication pores scattered all round.

Measurements:

Lz(26)0.497(0.071)mm; 0.360—0.640 mm.

lz(26)0.358(0.036)mm; 0.280—0.400 mm.

Lo(25)0.139(0.019)mm; 0.120—0.160 mm.

lo(25)0.159(0.019)mm; 0.120—0.200 mm.

Lov(21)0.350(0.032)mm; 0.280—0.400 mm.

lov(21)0.392(0.022)mm; 0.320—0.420 mm.

Remarks:

This species was erected by Verrill in 1879 as *Escharina porosa* for the material he collected in 1874 and first described in 1875 as being possibly representative of *Escharella pertusa* (Esper). Later, in 1912, Osburn described it as a synonym of *Cellepora pertusa* Esper, 1796, the type genus of *Hippoporina* Neviani, 1895. Recently Maturo & Schopf (1968) re-examined the species described by Verrill and commented that "there are at least five concepts of *pertusa* Esper, none of which encompasses *porosa* Verrill". Elucidating these points, they have confirmed the validity of Verrill's species. The present specimens agree in most of the features with the photograph of Verrill's specimens given in Maturo and Schopf's publication (Maturo & Schopf 1968, p. 87, fig. 12A). Length and width of the zooids and the nature of frontal are very similar. However, dimensions of the orifice and ovicells show slight differences. In the present case the orifices are slightly smaller and ovicells are slightly bigger than in Verrill's specimens. Nature of communication pores is almost similar.

Previous records from Indian waters:

This is the first record of this species from Indian waters.

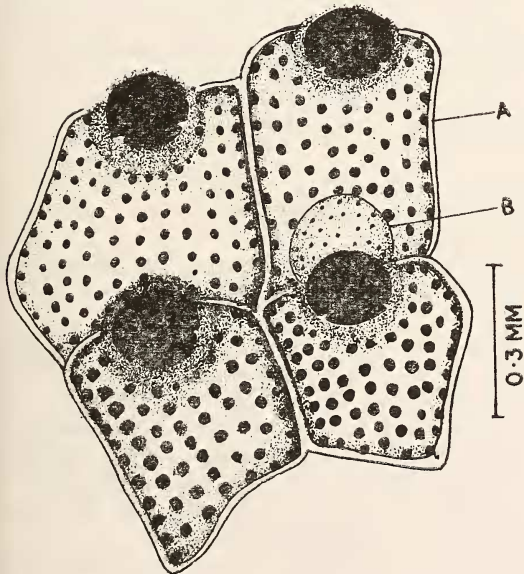


Fig. 9. *Hippoporina porosa* (Verrill)—Part of colony showing arrangement of zooids. A. Zooid. B. Ovicell.

Distribution:

"Vine Yard, Sound and Long Island Sound, 8 to 12 fathoms" (Verrill 1879) Gorgona, Colombia, Galapagos Islands (Hastings 1930).

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